UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,917	01/17/2006	Mark T. Johnson	GB 030117	5325

24737 7590 09/13/2010
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
SITTA, GRANT	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
09/13/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,917	JOHNSON ET AL.	
	Examiner	Art Unit	
	GRANT D. SITTA	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 January 2006* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments filed 07/06/2010 have been fully considered but they are not persuasive.

Applicant states:

> Aoki teaches a system, which is characterized in the background of the invention section of the instant application, where a frame displaying one picture is time divided into multiple sub-frames and the brightness of the subsequent **sub- frame** is attenuated at a designated ratio according to the brightness of the inputted picture.
>
> Thus, the brightness level of the subsequent (i.e., second) **frame** is a function a brightness level that is provided in the **first frame**. However, the brightness level of the **first frame** is the desired brightness level of the pixel. See, for example, para. 0012, of Aoki, which states "[i]t is preferable that the display device comprises **a sub-frame** generating means which time-divides a frame displaying one picture into multiple sub-frames, an attenuation signal generating means for generating an attenuation signal by dividing an inputted luminosity signal by designated attenuation coefficient and a signal switching means for inputting the luminosity signal before division to the antecedent sub-frame in the relevant frame and inputting the attenuation signal aller division to the subsequent sub-frame in the relevant frame."
>
> Thus, Aoki teaches that the luminosity signal (full brightness) is applied in the first frame and an attenuated signal is applied in the second frame.
>
> In addition, Aoki discloses that the second signal is a determined as a ratio to the first signal. That is the second signal is a known fraction (1/4) of the first signal. However, Aoki does not disclose that "said first non-zero current is determined based on a known ratio with respect to said second non-zero current." Rather, Aoki teaches that the signal (i.e., first current) in the first frame is the signal to achieve the luminosity (full brightness) and the second current is a portion (i.e., %) of this luminosity signal. (emphasis added)

2. Examiner respectfully disagrees and asserts the attenuated signal is during the subsequent (i.e. second) sub-frame, see underlined parts of para. 0012 above. Examiner believes Applicant intended subsequent sub-frames and Aoki is distinguishable because the luminosity (full brightness) is applied during the first sub-frame. However, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would

have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Under theses facts, Friend is relied upon to teach a number of detailed drive schemes could be used to achieve the desired brightness of each pixel. For instance, the pixel could (except when it is desired to be at full or zero brightness) be turned on once and off once in each cycle, with the time between the on and off switching chosen to achieve the required duty cycle (see FIG. 7), or more than once (see FIG. 8). FIG. 8 shows a plot of applied current against time for a single pixel. The lines 36 separate cycles of the drive scheme. During the three cycles shown in FIG. 8 the brightness of the pixel is increased from around 10% to around 40%. The on-time of the pixel is applied as a series of pulses of equal length t.sub.p which, when added together, give the total on-time per cycle needed to achieve the required duty cycle. With the total on-time per cycle kept the same, the pattern of current between the on time and the off time can be varied to suit other requirements--e.g. to reduce flicker or cross-talk, or Friend applies pulses of on-time in order to apply the desired brightness as shown in fig. 7 and fig. 8 below.

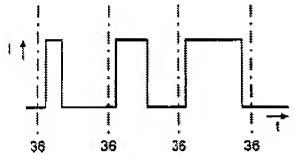


FIG. 7

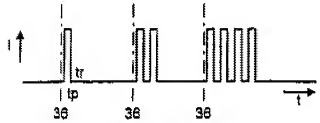
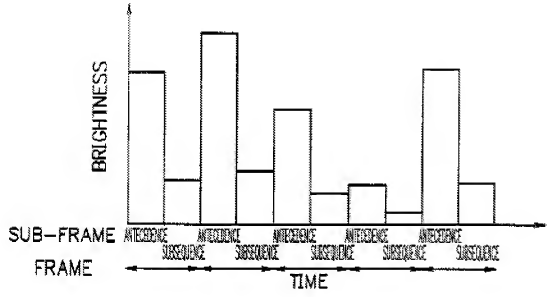


FIG. 8

Aoki teaches, [0012] it is preferable that the display device comprises a sub-frame generating means which time-divides a frame displaying one picture into multiple sub-frames, an attenuation signal generating means for generating an attenuation signal by dividing an inputted luminosity signal by a designated attenuation coefficient and a signal switching means for inputting the luminosity signal before division to the antecedent sub-frame in the relevant frame, and inputting the attenuation signal after division to the subsequent sub-frame in the relevant frame and wherein[0017] the display device of the present invention changes the attenuation coefficient according to the entire brightness of the picture of a frame. Aoki teaches applying a second subframe that is an attenuated signal of the first subframe, the first non-zero current will

always be determined on a known ratio of the second non-zero current, since the ratios are determined before, i.e, Sc1 is 1/1 of Sc, or 4/1 of Sc2 and Sc2 is ¼ of Sc1, see fig. 8.



However, as noted above the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Friend is relied upon to teach applying the total brightness of the frame in divided subframes, and Aoki is relied upon to teach said second non-zero current during said second sub-period achieving a brightness that is known percent of a brightness achieved by said first non-zero current in said first sub-period.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 2, 6, 7, 8-9, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friend et al (6,429,601) hereinafter, Friend in view of Aoki et al (2002/0003520) hereinafter, Aoki.

4. In regards to claims 1 and 14, Friend teaches an active matrix **(col. 4, lines 14-15 and abstract)** display device (6) comprising a display (2) with a plurality of display pixels (3), each having **(fig. 6 (23, 23, 21))**:

a current driven emissive element (14)**(fig. 5 19a-19d)**;

a data input (10) for receiving an analogue data signal **(fig. 5 input to (34));**

at least one drive element (T2) connected to a power supply and arranged to drive said current emissive element (14) in accordance with said data signal **(fig. 5 15a-d, 13a connected to data line, and connected to the scan line (10))**;

selecting means (T1; T1,T3,T4) arranged to provide **(fig. 5 (13a-d)),** in response to a select signal (18) **(fig. 5 10 scan line)**, said data signal to said at least one drive element (T2) to generate an overall brightness level during a frame period (F) in accordance with said data signal **(fig. 7 and 8 and col. 7, lines 18-35)**, wherein said device (6) is adapted to divide said frame period (F) in at least a first sub-period (F1) during which said emissive element **(fig. 8 pulses contained in a frame)**((14) carries a first non-zero current (I1) **(fig. 8 up arrow next to current and corresponding pulses, set of two pulses)** and a second sub-period (F2) during which said emissive element (14) carries a second non-zero current (I2) **(fig. 8 second of two pulses)**, said at least first and second non-zero current over their respective sub-periods substantially yielding said overall brightness level **(col. 7, lines 18-35)**

said first non-zero current is determined based on a known ratio with respect to said second non-zero current **(fig. 8 col. 7, lines 18-35 determined)** .

Friend fails to teach wherein said second non-zero current is maintained at a stable level lower than the first non-zero current and said first non-zero current is determined based on a known ratio with respect to said second non-zero current, said second non-zero current during said second sub-period achieving a brightness that is known percent of a brightness achieved by said first non-zero current in said first sub-period.

However, Aoki teaches wherein a second non-zero current (fig. 9 subsequent) is maintained at a stable level lower than a first non-zero current and said first non-zero

current is determined based on a known ratio ([0058] 1/4) with respect to said second non-zero current [0058], said second non-zero current during said second sub-period achieving a brightness that is known percent of a brightness achieved by said first non-zero current in said first sub-period [0009-0011].

It would have been obvious to one of ordinary skill in the art to modify the second non-zero current of Friend wherein said second non-zero current is maintained at a stable level lower than the first non-zero current and said first non-zero current is determined based on a known ratio with respect to said second non-zero current, said second non-zero current during said second sub-period achieving a brightness that is known percent of a brightness achieved by said first non-zero current in said first sub-period, as taught by Aoki in order to "[0009] to provide a display device which prevents the moving picture from being unclear and blurred or disordered, at the same time, controls the lowering of brightness of the picture."

5. In regards to claim 2, Friend teaches an active matrix display device (col. 4, lines 14-15) (6) according to claim 1, wherein said device (6) comprises a display controller (7) (fig. 6 (24) control apparatus) for generating said select signal (18) (fig. 6 (25) and fig. 5 scan lines (10)), said select signal (18) comprising at least a first select signal (18') triggering said first sub-period (F1) and a second select signal (18") triggering said second sub-period (F2) (fig. 7 and 8 and col. 7, lines 18-35).

6. In regards to claim 6, Friend teaches an active matrix display device (6) according to claim 1, wherein said device (6) comprises a display controller (7) adapted

to generate at least said first current (I1) and said second current (I2) by varying a voltage (13;15) over said current driven emissive element (14) (fig. 6 (24), fig. 7 varied current and col. 7, lines 18-35).

7. In regards to claim 7, Friend teaches an active matrix display device (6) according to claim 1, wherein said drive element (T2) is a thin film transistor having a short channel length (col. 4, lines 3-25).

8. In regards to claim 8, Friend teaches active matrix display device (6) according to claim 1, wherein said display pixels (3) are arranged in a matrix of rows (4) and columns (5), said device (6) comprising lines (13;15) for manipulating a voltage for said drive element (T2) for each row (4) or group of rows (4), and said device (6) comprises a display controller (7) adapted to scan said lines (13;15) along said rows (4) or group of rows (4) across the display (2) (fig. 6 25, 26 and fig. 8 pulses col. 7, lines 28-67).

9. In regards to claim 9 Friend as modified by Aoki teaches wherein said device (6) is adapted to yield a brightness at said second non-zero current (I2 Friend) of 30% or less of the brightness at said first non-zero current (I1) ([0058] ¼ <30% Friend).

10. In regards to claim 10, Friend teaches an active matrix display device (6) according to claim 1, wherein said display (2) comprises a subset of display pixels (3) or emissive elements (14) and said device (6) is adapted to supply said first non-zero current (I1) and said second non-zero current (I2) to only said subset (col. 7, lines 36-67).

11. In regards to claim 11, Friend teaches an active matrix display device (6) according to claim 10, wherein said display pixels (3) are coloured display pixels comprising red, green and blue emissive elements (14) and said subset is defined by colour (col. 6, lines 1-10) .

12. In regards to claim 12, Friend teaches an active matrix display device (6) according to claim 11, wherein said subset consists of said red and blue emissive elements (14) (col. 6, lines 5-10).

13. In regards to claim 13, Friend teaches an active matrix display device (6) according to claim 11, wherein said subset consists of said green emissive elements (col. 6, lines 5-10).

14. Claims 3, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friend and Aoki in view of Yamazaki et al (6,326,941) hereinafter, Yamazaki.

15. In regards to claim 3, Friend and Aoki differs from the claimed invention in that Friend and Aoki do not disclose wherein said first sub-period (F1) and said second sub-period (F2) are of different duration

However, Yamazaki teaches a system and method for wherein said first sub-period (F1) and said second sub-period (F2) are of different duration (fig. 5b col. 7, lines 1-56 varied duration and current of Yamazaki).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Friend and Aoki to include the use of various pulse shapes during sub-periods or different durations of sub-periods as taught by Yamazaki in order to

improve display quality with higher gradation between frame as stated in (col. 3, lines 35-67).

16. In regards to claim 4, Friend and Aoki as modified by Yamazaki teaches an active matrix display device (6) according to claim 3, wherein said first sub-period (F1) has a shorter duration than said second sub-period (F2) (fig. 5b 64To and 16To Yamazaki).

17. Claim 5 is rejected for the same reasons as claim 3. Furthermore, Friend and Aoki as modified by Yamazaki teaches an active matrix display device (6) according to claim 1, wherein said first non-zero current exceeds said second non-zero current (fig. 9 antecedence larger than subsequence Aoki) and (fig. 5b 64 To, 16 To Yamazaki).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Johnson et al (2006/0284894)

Taoka et al (2004/0155847)

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GRANT D. SITTA whose telephone number is (571)270-1542. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 571-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629

/Grant D Sitta/
Examiner, Art Unit 2629